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CLAIMS

What is claimed is:

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1. A recombinant MVA virus containing and capable of expressing at least one foreign gene inserted at the site of a naturally occurring deletion within the MVA genome.

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2. A recombinant MVA virus according to Claim 1 containing and capable of expressing at least one foreign gene inserted at the site of deletion II within the MVA genome.

3. A recombinant MVA virus according to Claim 1 wherein the foreign gene codes for a marker, a therapeutic agent or an antigenic determinant.

4. A recombinant MVA virus according to Claim 3 wherein the foreign gene codes for an antigenic determinant from a pathogenic virus, a bacteria, or other microorganism, or from a parasite, or a tumor cell.

5. A recombinant MVA virus according to Claim 4 wherein the foreign gene codes for an antigenic determinant from Plasmodium Falciparum, Mycobacteria, Herpes

virus, influenza virus, hepatitis, or human immunodeficiency viruses.

6. A recombinant MVA virus according to Claims 4 wherein the antigenic determinant is HIV nef or human tyrosinase.

7. A recombinant MVA virus according to Claim 6 which is MVA-LAInef or MVA-hTYR.

8. A recombinant MVA virus according to Claim 1 wherein the foreign gene codes for T7 RNA polymerase.

9. A recombinant MVA virus according to Claim 8 which is MVA-T7 pol.

10. A recombinant MVA virus according to Claim 1 wherein the foreign gene is under transcriptional control of the vaccinia virus early/late promoter P7.5.

11. Recombinant MVA viruses according to Claim 1 essentially free from viruses being able to replicate in human cells.

12. The use of a recombinant MVA virus according to Claim 8 for the transcription of DNA sequences under

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transcriptional control of a T7 RNA polymerase promoter.

13. A eukaryotic cell infected by a recombinant MVA virus according to Claim 1.

14. A cell according to Claim 13 infected by a recombinant MVA virus whereinthe foreign gene codes for T7 RNA polymerase.

15. A cell according to Claim 14 additionally containing one or more expression vectors carrying one or more foreign genes under transcriptional control of a T7 RNA polymerase promoter.

16. The use of cells according to Claim 15 for the production of the polypeptides encoded by said foreign genes comprising:

a) culturing said cells under suitable conditions, and

b) isolating the polypeptides encoded by said foreign genes.

17. A cell according to Claim 14 additionally containing expression vectors carrying viral genes, and/or a viral vector encoding the genome of a viral vector

under transcriptional control of a T7RNA polymerase promoter.

18. The use of cells according to Claim 17 for the production of viral particles comprising:

a) culturing said cells under suitable conditions, and

b) isolating the viral particles.

19. A cell according to Claim 14 additionally containing:

a) an expression vector carrying a retroviral vector construct capable of infecting and directing the expression in target cells of one or more foreign genes carried by said retroviral vector construct, and

b) one or more expression vectors carrying the genes encoding the polypeptides required for the genome of said retroviral vector construct to be packaged under transcriptional control of a T7 RNA polymerase promoter.

20. The use of cells according to Claim 19 for the production of retroviral particles comprising

a) culturing said cells under suitable conditions, and

b) isolating the retroviral particles.

21. A vaccine containing a recombinant MVA virus according to Claim 3 in a physiologically acceptable carrier.

22. The use of a recombinant MVA virus according to Claim 3 for the preparation of a vaccine.

23. The use of a vaccine according to Claim 21 for the immunization of a living animal body, including a human, comprising inoculation said living animal body, including a human with the vaccine.

24. The use of a vaccine according to Claim 21 containing MVA-LAInef for the prevention or treatment of HIV infection or AIDS.

25. The use of a vaccine according to Claim 21 containing MVA-hTYR for the prevention or treatment of melanomas.

26. A vaccine comprising as a first component a recombinant MVA virus according to Claim 8 in a physiologically acceptable carrier, and as a second component a DNA sequence carrying an antigenic determinant under transcriptional control of a T7 RNA polymerase promoter in a physiologically acceptable carrier, the two components being contained together or separately.

27. The use of a vaccine according to Claim 26 for the immunization of a living animal body, including a human, comprising inoculation of said living animal body, including a human, with the first and second component of the vaccine either simultaneously or with a timelag but using the same inoculation site.

28. The use of a recombinant MVA virus according to Claim 8 for the preparation of a vaccine.

29. A recombinant MVA virus containing and capable of expressing at least one foreign gene inserted at the site of a naturally occurring deletion within the MVA genome, said recombinant MVA virus being unable to form plaques on CV1 cells.

30. A recombinant MVA virus containing and capable of expressing at least one foreign gene inserted at the site of a naturally occurring deletion within the MVA genome, said foreign gene not causing infection or disease.